

**What is claimed is:**

1. A microscope for transmission viewing of a specimen, said microscope comprising:

a light source for producing a light beam;

an objective lens positioned for focusing the light beam produced by said light source on an area of the specimen for illuminating said area; and

a reflector means positioned for reflecting light, which has been focussed by the objective lens on the illuminated area and has been transmitted through the specimen, back through the illuminated area of the specimen.

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2. The microscope device as claimed in claim 1, wherein said light source is a light source for producing transmission light and epi-fluorescent light.

3. The microscope device as claimed in claim 2, wherein said light source is adapted to produce a light beam of a wavelength that is variable.

4. The microscope device as claimed in claim 1, wherein said reflector means comprises a body having a concave surface, which reflects the light beam.

5. The microscope device as claimed in claim 4, wherein said body of said reflector means is hemispherically-shaped.

6. The microscope device as claimed in claim 5, wherein said body of said reflector means is transparent.

7. The microscope device as claimed in claim 4, wherein said concave surface is adapted to reflect essentially all of the illumination light beam.

8. The microscope device as claimed in claim 4, wherein at least a portion of said concave surface is reflective with respect to at least a portion of the illumination light to produce oblique illumination of the specimen.

9. The microscope device as claimed in claim 1, wherein said objective lens comprises a concave shaped body which is operable to be optically coupled to the specimen via an immersion liquid for transmitting the light beam from said light source to the specimen.

10. The microscope device as claimed in claim 1, further comprising a holder for supporting the specimen on a surface facing away from said objective lens, said holder being transparent so as not to reflect the light beam.

11. The microscope device as claimed in claim 10, wherein said body of said reflection means is operable to be optically coupled to the holder via an immersion liquid for transmitting the light beam reflected by said concave surface to the specimen.

12. The microscope device as claimed in claim 4, wherein said concave surface is reflective over its entire area with respect to fluorescent light emitted by the specimen.

13. The microscope device as claimed in claim 1, further comprising a dichroic beam splitter for reflecting excitation light produced by said light source into said objective lens.

14. The microscope device as claimed in claim 13, wherein said dichroic beam splitter is essentially impermeable with respect to said excitation light and is essentially permeable with respect to fluorescent light.

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15. The microscope device as claimed in claim 1, wherein at least a portion of said reflector means includes a nonreflecting surface for transmitting laser light emitted from outside a boundary surface of said reflector means to a reflecting boundary surface to the surface of the specimen that reflects the laser light at an angle such that total reflection of laser light occurs at the boundary surface to the surface of the specimen by which fluorescent excitation of the specimen takes place in a near field area on said boundary surface.

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16. The microscope device as claimed in claim 1, wherein said reflector means comprises a body having an aperture for allowing particles flung from the specimen by action of the light beam to be captured by said reflector means.

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